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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,503	02/12/2004	Masato Naito	2927-0167P	3677
2292 7590 09/27/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER LEIVA, FRANK M	
			ART UNIT	PAPER NUMBER
			3714	
			NOTIFICATION DATE	DELIVERY MODE
			09/27/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/776,503

Applicant(s)

NAITO ET AL.

Examiner

Frank M. Leiva

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 02/12/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 02/13/2003 is noted, however, that applicant has not filed a certified copy of the Japan 2003-035594 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. **Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata et al (US 2001/0051548 A1) herein after Iwata.**
4. **Regarding claim 1; Iwata discloses:**
 - a. A method of designing a golf club head by using a computer, using a club head model and a ball model both of which are composed of a plurality of divided finite elements, (fig. 1 & ¶[0090]).
 - b. Executing a simulation of impacting said club head model against said ball model at a reference hitting position set in a sweet area of a face part of said club head model and a plurality of comparison hitting positions set outside said sweet area, (¶[0091-0092]), whereas stress values are computed using simulated collisions on three types of models.
 - c. Computing a stress generated in each of said finite elements by an analysis based on a finite element method, (¶[0094]),

d. When said club head model impacts said ball model at said reference hitting position and said comparison hitting positions; and controlling a thickness distribution of each of said finite elements, based on a difference in a value of a stress generated at said reference hitting position and a value of a stress generated at each of said comparison hitting positions, (¶[0091-0095]).

e. Approximating a value of said stress generated when said ball model is hit outside said sweet area to a value of said stress generated when said ball model is hit inside said sweet area, whereby said stress generated at said reference hitting position and said stresses generated at said comparison hitting positions are made uniform, (¶[0100-0102]).

5. **Regarding claim 2;** Iwata discloses:

f. Wherein said club head model consists of a wood club head model, (¶[0012]).

g. A control of said thickness distribution of each of said finite elements is executed by controlling a thickness of a metal plate composing said face part of said wood club head model, (¶[0021]).

h. Said stress generated at each of said comparison hitting positions is compared with said stress generated at said reference hitting position, (¶[0023]).

i. If said stresses generated at said comparison hitting positions are larger than said stress generated at said reference hitting position, portions of said metal plate disposed at said comparison hitting positions are thickened, whereas if said stresses generated at said comparison hitting positions are smaller than said stress generated at said reference hitting position, portions of said metal plate disposed at said comparison hitting positions are thinned, whereby said stresses generated at said comparison hitting positions are approximated to said stress generated at said reference hitting position, (table 1).

6. **Regarding claim 3;** Galloway discloses:

j. Wherein a Mises' stress generated in each of said elements when said ball model is hit with said club head model is computed from a main stress value at an integration point of each of said elements; and a maximum value of said

Mises' stress at each of said hitting positions is computed from a change of a time series of said found Mises' stress, ($\text{¶}[0060]$ & fig. 7).

k. A part of said face part disposed at said comparison hitting position generating a smaller maximum value of said Mises' stress than a maximum value of said Mises' stress at said reference hitting position is thinned, whereas a portion of said face part disposed at said comparison hitting position generating a larger maximum value of said Mises' stress than said maximum value of said Mises' stress at said reference hitting position is thickened, ($\text{¶}[0091-0095]$).

7. Regarding claim 4; Iwata discloses:

l. Wherein a Mises' stress generated in each of said elements when said ball model is hit with said club head model is computed from a main stress value at an integration point of each of said elements; and a maximum value of said Mises' stress at each of said hitting positions is computed from a change of a time series of said found Mises' stress, (fig. 5).

m. A part of said face part disposed at said comparison hitting position generating a smaller maximum value of said Mises' stress than a maximum value of said Mises' stress at said reference hitting position is thinned, whereas a portion of said face part disposed at said comparison hitting position generating a larger maximum value of said Mises' stress than said maximum value of said Mises' stress at said reference hitting position is thickened, ($\text{¶}[0091-0095]$).

8. Regarding claims 5 & 6; Iwata discloses wherein when said ball model is hit with said club head model at an initial speed of 40m/second, a maximum value of said Mises' stress generated at said reference hitting position and a maximum value of said Mises' stress generated at said comparison hitting positions is computed, a thickness of said element disposed at said comparison hitting position is altered so that a difference between said maximum value of the Mises' stress generated at said reference hitting position and said maximum value of the Mises' stress generated at said comparison hitting positions is not more than 8 kgf/mm²; and a simulation of impacting said club head model against said ball model is repeatedly executed to decide said thickness

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distribution, (∇ [0012-0014]), where testing a various speeds was used to calculate the Mises' stress.

9. **Regarding claims 7-10;** Iwata discloses wherein said reference hitting position is located inside a sweet area of said face part, and said comparison hitting position is formed at not less than three points outside said sweet area; and said reference hitting position is located in a region surrounded with straight lines connecting said comparison hitting positions, (fig. 8 & ∇ [0138-0143]), where the comparison between the sweet spot and the areas surrounding are described in table 8.

10. **Regarding claims 11-15;** Galloway discloses wherein said comparison hitting position is formed at two points, with one point disposed upward from said reference hitting position and the other point disposed downward there from, and at two points with one point disposed at a left-hand side of said reference hitting position and the other point disposed at a right-hand side thereof, (∇ [0036]), wherein the description of an ellipse mathematically inherently includes the two points center of curvature.

Citation of Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nesbit et al (US 5,877,970), Finite Element Analysis and Back weighting. Onuki et al (US 5,836,830) Golf club head design. Soong (US 5,931,746) Simulated golf ball collision. Kosmatka (US 2002/0028714 A1), contoured Golf club face. Galloway et al. (US 6,390,933 B1), Mises' stress vs. thickness.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Leiva whose telephone number is (571) 272-2460. The examiner can normally be reached on M-Th 9:30am - 5:pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert E. Pezzuto can be reached on (571) 272-6996. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FML

09/17/2007



Robert E Pezzuto

Supervisory Patent Examiner

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